DOCUMENT RESUME

ED 041 635 PS 003 451

AUTHOR	Blasdel, Joan
TITLE	Behavior Modification Procedures Applied to the Isolate Behavior of a Nursery School Child.
INSTITUTION	Kansas Univ., Lawrence. Head Start Evaluation and Research Center.
SPONS AGENCY	Office of Economic Opportunity, Washington, D.C.
REPORT NO	KU-HSERC-TR-13
PUB DATE	Aug 68
NOTE	21p.
EDRS PRICE	EDRS Price MF-$0.25 HC-$1.15
DESCRIPTORS	*Behavior Change, Interaction, *Peer Relationship, Prompting, *Reinforcement, *Socially Maladjusted, Social Reinforcement, Therapy, Verbal Operant Conditioning
IDENTIFIERS	Head Start

ABSTRACT

This study used reinforcement principles to investigate some procedures for helping a 4-year-old Mexican-American girl establish peer contact in a Head Start class. Although Diane was healthy and intelligent, she had a low rate of attendance at school and spent most of her time there in isolation. The first procedure employed in the study was the controlled use of adult social reinforcement. A teacher was supposed to go to, talk to, smile at, touch, and praise Diane for participating in peer interaction. Due to Diane's impoverished peer-play repertoire, however, there were very few responses to reinforce and other procedures had to be tried. The adults next structured play situations to include Diane and gave her other prompts intended to lead to peer interaction that could be reinforced. As a result of this procedure, peer contact was markedly increased and prompting was subsequently phased out. It was also seen that the prompting-reinforcing process could be used to increase certain classes of behavior (such as verbal or nonverbal). In the final phases of the study, a rise in spontaneous, nonverbal behavior was seen and Diane's attendance at class became more regular. Behavior modification principles were therefore judged to be effective in remedying the subject's isolate behavior. (MH)

U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OE EDUCATION POSITION OR POLICY.

ED041635

BEHAVIOR MODIFICATION PROCEDURES APPLIED TO THE ISOLATE BEHAVIOR OF A NURSERY SCHOOL CHILD

TECHNICAL REPORT

RESEARCH

Report No. 13

Joan Blasdel

UNIVERSITY OF KANSAS

HEAD START EVALUATION AND RESEARCH CENTER

University of Kansas, Lawrence, Kansas

PS003451

The research reported herein was performed, inpart, pursuant to a contract with the Office of Economic Opportunity, Executive Office of the President, Washington, D. C. 20506. The opinions expressed herein are those of the author(s) and should not be construed as representing the opinions or policy of any agency of the United States Government.

Blasdel - 13

INTRODUCTION

Reinforcement principals have become increasingly important as an effective and efficient method of changing specific behaviors of young children. In the University of Washington laboratory preschool Florence R. Harris reported work with regressed crawling.[1] In this same preschool, reinforcement principles have been used to combat such problem behaviors as excessive crying, aggression, dependency, and a very low rate of activity. Allen, K. E., Hart, B. M., Buell, J. S., Harris, F. R., and Wolf, M. M. reported work with the isolate behavior of a nursery school child.[2]

The present study was undertaken to investigate some procedures for establishing peer contact in a child who did not initiate or respond to peers verbally and/or nonverbally in free play settings. Since the ability to interact with peers is essential to a successful school experience, information on how to systematically encourage peer play seemed to be of value to teachers in a Head Start program. This study was begun without delay when teachers expressed concern for the subject's consistent decline in attendance over the five months school had been in session and her isolatory behavior.

The first procedure employed in the present study to combat isolatory behavior was the controlled use of adult social reinforcement to aid the subject in establishing contact with peers. Due, however, to the impoverished peer play repertoire the subject demonstrated while under contingent adult attention in the first phases of the study, a second procedure for establishing peer contact was introduced and examined.

The adult structured play situations to include the S, prompted the subject and her peers to participate and interact with each other in a cooperative game, socially reinforced such interactions by the subject and gradually faded out the prompts. Fading procedures similar to those used by Wolf, Risley and Mees (1964) were used to transfer the control of the response from the stimulus prompt to the stimulus game while eliminating to a great extent the prompts in the course of a game.[3]

---

[1] Harris, Florence R., Johnston, Margaret K., Kelley, C. Susan, and Wolf, M. M. Effects of Positive Social Reinforcement on Regressed Crawling in a Preschool Child. Journal of Educational Psychology, 1964, p. 35-41, 55.

[2] Allen, K. E., Hart, B. M., Buell, G. S., Harris, F. R., and Wolf, M. M. Effects of Social Reinforcement on Isolate Behavior of a Nursery School Child. Child Development, 1964, p. 35, 511-518.

[3] Wolf, M. M., Mees, H., and Risley, T., Application of Operant Conditioning Procedures to the Behavior Problems of an Autistic Child, Behavior Research and Therapy, 1964, p. 1, 305-312.

METHOD

Subject

The subject of this study was a 4.2 year old Mexican American female with five months of Head Start experience. Diane was an alert child, physically well-coordinated, who had mastered to a high degree those pre-academic skills related to curriculum, but who was totally lacking in social skills with her peers. She seemed fully equipped to succeed in the give and take of play with children, yet she did not develop behaviors that enabled her to initiate or maintain play relationships. She seemed to ignore children. The adults in the environment responded to her isolation by involving her in play with adults on a one-to-one basis.

Diane had a low rate of attendance at school from the first month she entered. Normally she resisted coming to school and she elected to stay home in order to play with her many brothers and sisters. The family was large, close-knit and suspicious of outsiders. They had little contact with the community. Diane's siblings were reported to have difficulty also in adjusting to social contacts outside the family circle. Diane's mother was affectionate with her children but was permissive and often permitted them to stay home rather than attend school or summer camp where adjustments to contacts outside the family had to be made.

Procedure

Baseline data on Diane's social behavior was secured as a preliminary step to modification procedures. A total of 45' of observation of Diane's social interactions with adults and peers in the free play setting was taken on five different days.

A variety of modification procedures were designed in an effort to permit in the early phases as much spontaneity in the subject's peer contacts and independence of adult structure as possible. Later procedures involving adult structuring of peer interactions by means of prompts were to be employed only if it was demonstrated in early phases that the subject's peer play was so impoverished that social reinforcement, the only reinforcement permitted by the teachers, could not increase it and structuring interactions was necessary.

The duration of each phase was to be long enough to demonstrate the effectiveness of the procedure in increasing peer contact. Each manipulation varied in duration. Since time to modify the subject's behavior was initially at a premium those manipulations which proved ineffective in increasing the subject's peer contact were generally of shorter duration than those which eventually did accomplish the goal of the study.

Probes in each phase were designed to ascertain the variable that effected a change in the subject's social behavior. The probes in the first two manipulations were as short as possible so that more time would be available for development of social behavior.

All experimental sessions were conducted during an available 60' of free play time. Sessions 1-49 on Figures 1, 2 and 3 do not represent successive school days. Though the study was conducted five days a week barring absentism and field trips, the rate of absentism was high between sessions 15 and 16 and between sessions 20 and 21. In addition a lapse of a month and a half when the experimenter discontinued the study exists between session 22 and reinstatement of baseline on session 23.

The experimental setting 79 percent of the time during the total 49 sessions was the regular classroom composed of a large playroom. There were 16 males and 7 females in the class and anywhere from 6 to 8 adults. The remaining 21 percent of the time during the total number of sessions the free play area setting was the school basement, school playground or public park. Manipulations and probes were also conducted in these areas.

Teacher Attention for Subject's Peer Proximity and/or Contact Verbally and/or Nonverbally.

The procedures in sessions 6 through 11 made adult attention contingent upon Diane's two feet proximity to peers. In addition the subject's verbal and/or nonverbal contact with peers was to be reinforced immediately with adult attention. Adult attention was defined as: A teacher's going to, talking to, smiling at, touching and praising the subject. If this direct approach to Diane tended to draw her away from peer play and into interaction with adults, the teacher directed attending behaviors to Diane, not as an individual, but as a participant in group play. When Diane played alone or when she contacted an adult to engage the adult in an activity she was not given attention. The adult would become occupied with some other child or with equipment. Since an adult had to be free and close enough to Diane to deliver or withhold reinforcement as soon as she emitted the designated behavior, one teacher was assigned the role of reinforcer--teacher. She was instructed to remain at all times within range of Diane and to carry major responsibility for immediate reinforcement.

A fifteen minute probe was introduced every other day when conditions were returned to normal. Adults were instructed to treat Diane for this 15' as they would any other child. All restrictions on their attention toward her were lifted. This probe was designed to investigate the role of reinforcement in maintaining Diane's peer contact. If peer interactions decreased during the probe and increased when reinforcement procedures were reinstated, it would be demonstrated that the reinforcing stimuli used were the determining conditions in the behavior change.

Teacher Attention for the Subject's Verbal and/or Nonverbal Contact with Peers

The procedures for sessions 12-20 were the same as those for sessions 6-11 with one major exception. Diane was no longer reinforced for two feet proximity to peers. Proximity was dropped as a condition because no baseline data was available for this variable.

Social Reinforcement for the Subject's Peer Contacts and Prompting of the Subject and Peers to Interact

The procedures for sessions 21 and 22 called for the experimenter to prompt the subject to interact nonverbally with peers. Playing ball was an activity prompted most often. Both the experimenter and the reinforcer teacher assigned to Diane in sessions 6-20 gave their attention to her when she made verbal and/or nonverbal contact with peers. Responsibility for reinforcement of peer contact was shared by the experimenter in order to determine in a probe the role of teacher attention in maintaining peer interactions. Since this manipulation was employed for only two days prior to the discontinuation of the study for a period of a month and a half the probe session did not occur.

Teacher Prompts and Attention Given for Subject's Peer Contacts

In this phase of the experiment designated by sessions 25 through 43 an assigned teacher who had demonstrated a rapport during the second baseline with the subject was responsible for prompting interactions between the subject and her peers in a series of cooperative games. In addition to these games which entailed interaction in order to complete the task, other situations in which Diane placed herself during free play. Gradually after the rate of Diane's peer contacts reached what was judged a reasonable level, an intermittent schedule of prompting sufficient to maintain the behavior was to be established. Teacher attention was given immediately for the subject's interaction with other children. Activities such as hiding objects, lotto, puppets, puzzles, building and role playing were selected as activities ripe with opportunities for interaction in the classroom whereas art, records and books were regarded as isolatory activities and therefore unacceptable in terms of promoting interactions. Though the children's interest level governed the length of time spent at any one activity some attempts were made to set a consistent time limit on each activity. Outdoor cooperative play that was generally prompted was ball, tag, waterplay and swings. Tasks such as the guessing game, lotto, puzzles and building were played with a set structure.

The object guessing game required that S's partner be instructed to place three objects in a row before S, calling attention to each object by asking S to name it. S's partner was then told to say to S, "Now shut your eyes." S's partner was then told to hide one of the objects with a small box cover, say to S, "Open your eyes. Look! which one did I hide?" If the S did not guess correctly or at all S's partner was instructed to say to S, "Close your eyes and feel under the box. What did I hide?" If S still did not answer she was given the correct response and instructed to verbalize it to her partner. The S was then prompted to initiate the same procedure to her partner. The difficulty of the game could be increased by increasing the number of objects set out on the table.

The puzzle task consisted of three sets of flat rubber objects (animals, family, transportation) that fitted loosely into wood frames. On each trial the children were given a puzzle frame and four rubber forms and were instructed to place the forms on the appropriate frames. Two of the forms given each child were needed by the other child to complete his puzzle. Thus it was necessary for the children to exchange blocks in order to complete the task. The teacher prompted the children to ask each other for the needed pieces. They were also prompted to verbalize to each other the names of each puzzle piece such as, "This is the mother, father, etc."

The lotto game required that S ask, "What is it?" for each card that matched one of her partner's. Once the partner had identified the picture S was instructed to hand the card to the other child. Similar instructions were given to the other participant in the game.

The finger puppet game required that the children build a puppet theatre from twelve multi-colored 8" x 10" slotted cards, up or out, in house of cards style. They were prompted to ask questions of each other concerning individual cards and the total structure once built. They were told to hand cards to each other and to help each other steady the structure when cards were placed upon it. When the theatre was built, the children were prompted to perform verbally with their puppets.

Each block of five, then three, then four, then three experimental sessions was interspaced with a 60' probed session during free play. The probe session consisted of discontinuation of prompts while social reinforcement was given contingently on the subject's peer contacts.

Prompts Given by the Teacher for Subject's Peer Contacts

The same procedures related to prompting were used for sessions 44 through 49 as had been employed for sessions 25 through 43. Social reinforcement for the subject's peer contact was no longer considered as the most effective tool in maintaining Diane's peer contacts, and therefore contingent teacher attention for peer contact was eliminated in this final manipulation. With only six days remaining before the school year ended, two 60' probes were interspaced with every two days of prompting. The probes were introduced to investigate the generalization of the behavior when prompting closed.

Recording

The Social Interaction Observation procedure devised by the University of Kansas Head Start Evaluation and Research Center, in its affiliation with the Department of Human Development was used with some modification to record the social interaction behaviors of Diane. The procedure involves observing a child for a 3' period of time and recording objectively in 10" intervals any interactions, verbal or nonverbal, that occur with any peer or adult in the free play environment. Behaviorial definitions, recording symbols and all procedures and rules with the exception of the following were observed strictly:

PS 003451

1. Do not observe outside. Observation was done outdoors at times. Problems in observing Diane outdoors were minimal and not detrimental to accurate recording. She did not function in a large area outdoors but tended most generally to play in a small area on one preferred piece of equipment. In any setting where large muscle equipment was available she played nonverbally rather than verbally and therefore there was no problem in discriminating verbal interactions.

2. An initiation followed by a response which results in a subsequent series of behaviors emitted by two or more persons interacting across two or more 10" intervals is recorded as an interaction chain. Chaining is recorded as long as one of the two or more persons is emitting verbal and/or nonverbal behaviors within a 10" interval.

   Since chaining does not permit an evaluation of the particular party or parties emitting behavior in each subsequent interval after the initial interaction it was not feasible as a means of recording the percentage of intervals S made contact with peers as depicted in figure one. Therefore, each 10' interval on the recording form for this study was considered a discrete interval. The person who first initiated contact in each 10" interval was recorded as the initiator for that interval. For activities such as rocking toys, teeter totter and tag which resulted in nonverbal interdependent behaviors that continued across two or more intervals, the iniator of the interaction in the first interval was recorded as the initiator in subsequent intervals. The interaction between the S and the peer had to terminate before a new initiator could be recorded.

Observer Reliability

While interobserver reliability was being established, the experimenter and a reliability checker simultaneously recorded the behaviors of the S, in the same intervals on their respective recording forms using separate stopwatches. Five full sheets or 60' were counted for figuring reliability on six different experimental sessions. Agreements and disagreements between what had been recorded by the two observers during the simultaneous observation sessions were counted. If there was even one disagreement between symbols or placement of symbols within the 10" intervals being evaluated, it was considered a disagreement. Total agreement required agreement in all triangles, verbal and nonverbal, with the 10" interval. All symbols had to be exactly the same and recorded in the same place. The reliability was computed by counting the total number of agreements and disagreements for those intervals in which something was recorded by one or both of the observers. The observers then divided the agreements + the disagreements (i.e., the total intervals in which one or both recorded something) into the agreements to obtain a percentage of observer reliability. In all cases reliability checks during the course of the study showed observer agreement of 70 percent or better.

RESULTS

Baseline I. During this baseline period, a time in which there was no change from the teachers' previous treatment of Diane, the data showed that Diane spent an average of 16 percent of the total number of intervals she was observed in contact with adults. She made an average of .04 percent peer contact (Figure 1, Baseline). This contact was totally nonverbal (Figure 3, Baseline). Diane's activities were isolatory in nature such as looking at books, painting at the easel or sitting or parallel playing in the doll corner. There was one adult for every 2.5 children in the classroom. Consequently an isolate like Diane received a disproportiionate amount of adult attention. Adults were constantly involving Diane in interactions with them on a one-to-one basis.

Teacher Attention Contingent on S's Two Feet Proximity and Peer Contact

The proof of any behavior change being a direct function of reinforcement could not be demonstrated. When Diane was left to her own resources in making contact with other children and socially reinforced for such contact she demonstrated that she had very little play behavior the teacher could reinforce. After six sessions of reinforcement of social interaction with children and two feet proximity and ignoring all other behavior the total percentage of intervals Diane made contact with peers averaged 1 percent (Figure 1, Man. I). This average was hiked to 2.3 percent for three probes when conditions in the classroom were returned to normal. A rise of 7 percent peer contact during the probe on session 7 cannot be explained and it dropped back to 0 percent on the next two probes. Also on session 7 total percentage of intervals contact between S and peer group occurred also rose to an unexplainable high of 17 percent (See Figure 2). The contact made by Diane was totally nonverbal (Figure 3, Man I). Generally Diane entered the room, hung up her coat, and for the remainder of the free play time sat at the book table passively leafing through a book. The teacher seldom had an opportunity to test her reinforcing function. The book table did not often attract Diane's peers who were aggressive and active.

The teacher assigned to reinforce Diane seldom had the opportunity to exercise her reinforcing function. This factor coupled with the fact that the teacher at times failed to reinforce appropriate proximity and contacts made it impossible to evaluate the reinforcer.

Teacher Attention Contingent on S's Peer Contact

The contact Diane made with peers during the nine sessions (12 through 20) when she was systematically being given teacher attention for that averaged 2.3 percent under contingent reinforcement dropped to 0 percent during the 15' probes every other day when conditions were returned to normal. During these probes teachers tended to respond to Diane as they had during baseline 1. They gravitated to her and layed with her on a one-to-one basis. The percentage of intervals in which contact between

Diane and other children occurred averaged 5.8 percent for nine experimental sessions as shown in Figure 2. The average dropped to 1 percent during the four probes.

It was impossible to draw any valid conclusions concerning the reinforcer at this time because Diane's performance was unstable during experimental sessions due to a high rate of absentism. A lapse of eight days existed between sessions 15 and 16. It was a common occurrence for Diane to resist attending school after a week-end break or after a legitimate brief absence due to illness. She would at these times throw a tantrum and her mother would comply with her wishes. Diane fought any attempts her mother did make to clean her and dress her for school. The bus driver hadn't the time to wait outside Diane's home while her mother accomplished the difficult task of getting her ready to go. The teachers at school did not have the time to bring Diane to school when she refused to come. Therefore the experimenter brought her to school on periodic occasions. She was not observed on these days because free play time was gone by the time Diane arrived at school and had stopped crying. Diane's elected absentism reflects her lack of social success with peers at school. When one of her peer group would initiate some contact with her once or twice and she didn't respond, they would ignore her and seek out someone who would respond. Therefore Diane was highly dependent upon her siblings as her only source of peer interaction. It was the intention of the next phase of the study to tip that imbalance.

By this time it was clear that the situation was going to have to be structured in order to lead Diane into play with peers. Once the behavior could be maintained at a reasonable level, prompting, the essential feature in the next phase of the experiment could be gradually faded out.

Experimenter Prompts for S's Nonverbal Peer Contact and Adult Attention Given for Peer Contact

In this phase Diane was prompted to interact with her peer group by the experimenter and responsibility for socially reinforcing Diane for such contact was shared by the experimenter and the teacher. As shown on Figure 1, sessions 21 and 22, under these conditions Diane's rate of peer contact increased sharply over baseline and the first two manipulations to an average of 39.5 percent. The average percentage of contact made by Diane during baseline was .04 percent during contingent reinforcement for S's peer proximity and contacts was 1 percent and during contingent reinforcement for S's peer contacts was 2.3 percent. It was assumed when contingent adult attention for contact with peers was the condition at the conclusion of session 20 that Diane was in need of prompting for peer contact in order to establish that behavior. Clearly the marked increase in Diane's contact once prompting was introduced bears out the validity of that assumption.

The data on Figure 2 shows an even more marked increase in percentage of total intervals in which contact between Diane and her peer group

occurred. The average rate when prompting was added to the procedures was 81% as compared to the .04% during baseline, 33% during experiment sessions 6 through 11 and 5.8% during experiment sessions 12 through 20. Two of the children in the class, a female and a male, were quite easy to prompt into play with Diane.

As shown in Figure 3 all contact Diane made with her peer group during sessions 21 and 22 was nonverbal. This total lack of verbal behavior is understandable in light of the fact that initially Diane had no significant rate of peer contact, verbal or nonverbal. In this phase Diane was being prompted to interact nonverbally with other children. An example of such a prompt was "Diane, roll the ball to Johnny." and then "Johnny, roll the ball back." Generally the rolling of the ball required only one prompt for each child to get the interaction going. Since the activity was continuing in nature, the rolling of the ball back and forth between Diane and a peer would be spontaneous over intervals. Once it ceased the experimenter prompted it again. By spontaneous interaction is meant that Diane and her peer having learned the cues for playing an interdependent game were able to play the game independent of prompts from the teacher for a 10" interval or more. As shown in Figure 4 of the average 39.5% peer contact made by S, 31% of it was spontaneous and only 8.5 % of this nonverbal contact was prompted.

A reliability check for total recorded intervals during session 22 was 89%. Other reliability checks were done prior to the introduction of Baseline II. These checks were 70 % or better.

Baseline II. Between session 22 and Baseline II, the study was discontinued for a month and a half. There were varying reports by the teachers concerning Diane's behavior in the classroom for the 1 1/2 months. The head teacher reported that Diane had often cried and seemed to regress during this period. The teacher who was assigned to Diane in the first three phases of the study reported no significant change in Diane's behavior for the period the study was discontinued. The only reliable information the experimenter could provide for this period was a decline in Diane's attendance from 70% attendance in the month of April to 40% attendance in May. The study was discontinued on April 16 and resumed again with Baseline II on June 3rd. Diane had been absent for two weeks straight prior to Baseline II. Figure 5 shows Diane's record of attendance from the time she entered the class at the beginning of October to the closing school date, August 16. From the month she entered school until the study began on January 3rd her attendance had been on a steady decline. Once the study was begun her attendance rose during the months of January, February, March, and April simply because the experimenter brought her to school in these months if she refused to come and the bus driver couldn't wait on her. Once the study was discontinued after April 15 and the experimenter no longer brought Diane to school, her attendance dropped for that period.

During the second baseline period, a time in which there was no manipulation of the environment, Diane's contacts with adults and peers during free play were observed for two days. On the first day the contact Diane made with peers was 11%, considerably lower than what it had been in the experimental session 1 1/2 months earlier under prompting and reinforcing conditions. Yet this first session during Baseline II reflected a significant increase in the behavior over Baseline I as shown in Figure 1. The 11% peer contact made by Diane on session 28 dropped to 0% contact on session 29 in Baseline II. The 11% high on the first day was caused by a teacher's inadvertently instituting the prompting procedure that had been used prior to the discontinuation of the study. On the second day during free play time neither this teacher nor others prompted Diane to play with other children and thus her rate of play dropped back to 0%.

Prompting and Teacher Attention for Peer Contact

This phase was begun at the beginning of the summer session. The peer group was nearly the same as had been enrolled a month and a half earlier. Two females and three males had dropped out. The teacher who was assigned to contingently reinforce Diane in the first three phases of the experiment had left the school program for the summer. Thus the teacher who had inadvertently prompted Diane with some success on the first day of Baseline II was selected to assume the responsibility of prompting and reinforcing with her attention Diane's peer contacts in experimental sessions 25 through 43. It was decided that the teacher was more appropriate than the experimenter for the task of prompting. This decision was based upon the notion that any success Diane might come to enjoy in her relationship with her peer group should be paired with the permanent members of the classroom rather than an outsider only temporarily present in the environment.

As shown on Figure 1 the percentage of intervals Diane made contacts with peers averaged 33.2% for 15 sessions, 25 through 43. Comparitively little decline had occurred in Diane's peer contact from the average 39.5% for 2 sessions, 21 and 22. The same condition, prompting and reinforcement, was implemented in both phases, sessions 21 and 22 and sessions 25 through 43. Two variables had altered however. In sessions 25 through 43 the teacher, rather than the experimenter, prompted Diane and only the teacher reinforced Diane. Whereas the experimenter in sessions 21 and 22 had prompted only nonverbal interdependent activities, primarily ball rolling, the teacher in sessions 25 through 43 prompted both verbal and nonverbal peer contacts. Diane and her peers were encouraged to play as much as possible games such as lotto, hiding objects, and puppets which required verbal contact in order to complete the task.

Two major points must be emphasized concerning these two variables. First, the condition of prompting and rinforcing maintained the level of peer contact Diane made despite the fact that the implementation of

these procedures was conducted by different adults. Thus any adult who could establish a rapport with the child could bring her under prompted control. Secondly, once prompted for both verbal and nonverbal peer contact by the teacher the average percentage of intervals Diane made verbal contact with her peer group was 17.7% and 15.5% nonverbal contact (Figure 3). The experimenter had only prompted nonverbal peer contact in sessions 21 and 22. Until verbal contact was prompted as well in sessions 25 through 43 it was nonexistent. Contingent reinforcement as the sole procedure wasn't sufficient in sessions 6 through 20 to even establish peer contact made by Diane, let alone establish verbal behavior directed at peers. Clearly prompting as a means of establishing peer contact coupled with social reinforcement for such contact had made significant inroads upon Diane's behavior. Perhaps the rate of verbal behavior directed at peers could have been increased even more under prompted control had the experimental setting in sessions 25, 29, 40, and 42 not shifted for 20' or more of the available free play time to areas outside the regular classroom where it was difficult to prompt verbal contacts. During this time the children played in areas where large muscle equipment was available. These sessions (25, 29, 40, and 42) as shown on Figure 3 reflect a decline in verbal contact made by Daine and a rise in nonverbal contact. The experimental setting alone does not account, however, for this decline in verbal behavior. Several other factors as well may account for it. Beginning on session 38 Diane had come under more diversified adult control. The teacher who had consistently prompted and reinforced Diane beginning on session 25 no longer functioned in this role after session 37. The classroom teachers expressed concern that Diane was too dependent upon one individual and insisted upon a broader base of adult control. Diane's rate of peer contact did not decline when other teachers shared the role of prompter and reinforcer, but the rate of verbal behavior did decline. The correlation may be accidental and certainly since the setting for a longer period of time during some sessions was located in areas with large muscle equipment, it was impossible to determine which variable accounted for a decrease in verbal behavior. One other factor that may have had some bearing on this decline in verbal behavior was the resistance to games requiring verbalizations. Perhaps even a wider selection of such games should be made available in order to keep interest at a premium.

In addition to verbal behavior Diane directed at peers while under the condition of teacher prompts and reinforcement, a fair portion of the total contacts recorded were spontaneous. As shown in Figure 4 only an average 13.5% of the total peer contacts Diane made for 15 sessions was prompted. The remaining 19.8% peer contact made by Diane was spontaneous. By spontaneous verbal contact is meant that Diane having learned the verbal cues for playing a cooperative game such as hiding objects would employ these verbalizations independently of the teacher's prompt in order to play the game.

Conversation that was not related to the games, however, was non-existent. Diane would, on the other hand, respond to peers nonverbally independently of game tasks. It must be pointed out, however, that Diane was in need of the teacher or another peer to initially begin the play. She seldom initiated the beginning of ongoing play with another peer herself. Much of the interaction that occurred in sessions 25-43 was prompted, but there was also considerable spontaneous behavior directed at peers. In baseline 1 that behavior didn't even exist, spontaneous or otherwise.

Diane's spontaneous behavior was clearly at its peak whenever her nonverbal behavior was on the rise. Certainly some indication of this correlation can be seen in an earlier phase of the experiment. When the experimenter prompted nonverbal contacts and both teacher and experimenter reinforced them, Diane's average nonverbal behavior for sessions 21 and 22 was 39.5%. 30% of that 39.5% was spontaneous. During this present phase of the experiment teacher prompting and reinforcing peer contact, sessions 40, 41, and 42 show an increase in nonverbal contact and concurrently an increase in spontaneous contact.

It was interesting to note that while prompting was in effect as a technique of establishing Diane's peer contact, her rate of attendance skyrocketed. This attendance was totally voluntary. Diane came on the school bus. As shown in Figure 5 the attendance rate for the months of July and August was 94% or better. Granted this correlation could be related to other factors. Children are often healthier in the summer months. But it was evident in earlier months under other experimental conditions that Diane's health was not the reason for her absence from school. The experimenter would often find her outside her house playing with her sisters on mornings she had refused to come to school. During that period of time she fought coming to school after a break of several days when she was at home. But now Diane's attendance as well as her withdrawal behavior during prompted experimental sessions changed radically. She seemed more enthusiastic in her play with peers and she smiled often when in the presence of a selected few peers. Prior to prompting her contacts with peers, she not only often elected to play at home rather than come to school, but while at school she remained passive and stone-faced. Indeed the experimenter began to think of her during these times as the Sphinx. Perhaps the mother's efforts at home may have contributed to this significan rise in Diane's attendance.

Prompting S and Peers to Interact

The method employed in this phase designated by sessions 44 through 49 was the same procedure in relation to prompting as that used in experimental sessions 25 through 43. The teachers, utilizing the inter-dependent games as much as children's interest would allow, prompted contacts between Diane and her peers, then removed themselves from the situation, watched for the interaction to cease, and returned to the

area to prompt other contact. Teachers were no longer reinforcing such contact with their attention. It had been surmised in earlier sessions that reinforcing contact between S and her peers tended to disrupt ongoing peer play. Now adult attention was constant with attention normal for the group. By this time teachers were spending a minimal amount of time in even close proximity to Diane and her peers.

Probes for 60' of free play time interspaced with 5, then 3, then 4, then 3 experimental sessions were employed to investigate the role of social reinforcement in maintaining Diane's contact with peers. The average rate of Diane's peer contact during 15 experimental sessions when both prompting and reinforcement were in effect was 35%. The average rate of peer contact in 4 probe sessions when only reinforcement for contact was in effect was 8%. On probe session 34, however, the teachers inadvertently prompted 4% of Diane's 14% peer contact for that day. Thus counting the rate of Diane's peer contact in that session as 10%. The average rate of contact for all probe sessions is 7%. Clearly then the reinforcement was not as effective a tool in maintaining the rate of Diane's peer contact. This assumption became even more valid when the probes of the next experimental phase of the experiment were examined and compared to probes in this phase. As shown in Figure 1, the average rate of peer contact when reinforcement was given for such contact in probe sessions 30, 34, 39, and 43, was 7%. The average contact Diane made with peers in probe sessions 46 and 49 when neither prompting or contingent reinforcement were being applied was also 7%.

Reliability checks were taken on sessions 29, 36, and 41. Reliability for total recorded intervals on each successive 60' session was 72%, 70%, 75%.

The results of the prompting method employed without reinforcement in sessions 44, 45, 47, and 48 were immediately evident. By the end of the first session the percentage of intervals Diane spent in contact with peers was 33%, and increase of 2% over the last experimental session when both prompting and reinforcement had been in effect. For the four days of teacher prompting interactions without reinforcing them, Diane spent an average 30% of each free play session in contact with peers. She had spent an average 35% of each play session in contact with peers when she was being prompted and reinforced. Thus priming may have been the changing behavior more effective of the 2 procedures during experimental sessions 25 through 49 and prompting again once it had ceased.

As shown on Figure 3 Diane's nonverbal contact with peers is on the rise in sessions 44 through 49. Concurrently her spontaneous behavior as shown on Figure 4 is well above the level of prompted contact. At this point in the study the games such as lotto and hiding objects which required verbal contact were being played less and less. Other activities interested Diane and her peer group more. In addition when the teacher assumed a background role, Diane chose more and more to interact nonverbally

with peers. Verbal contact made by Diane appeared to be under the control of the teacher and games.

During this last phase of the experiment (sessions 44-49) every two days of experimental sessions was interspaced with a 60' all play session when prompting was withdrawn. Attention during experimental sessions as well as probes was given to Diane in amounts normal for the group and was by no means contingent upon Diane's peer contacts. On the first probe Diane's contact with peers was 6% and on the second probe it had risen to 8%. The second probe day was atypical in terms of the attendance of the peer group. Only one female peer out of four who regularly attended was present. Six of the males regularly in attendance were absent the last day of school. Three of these males had played more than all other males in the class with Diane during previous experimental sessions. The average percentage of intervals Diane spent in contact with peers when not prompted was 7% for 2 probes as compared to the average 30% contact in 4 experimental sessions when prompts were given for contact. This average 7% did reflect some improvement in Diane's rate of peer contact over baseline 1 when peer contact was nonexistent. However, it was evident that Diane's peer contact at this point was very much dependent upon prompting particularly in order to establish the initial contact with peers. This lack of ability to assert herself initially into play with peers was evident in both experimental sessions and probed sessions.

It would take many more sessions in this final phase of the experiment before Diane could be weaned totally away from prompting, and the reinforcing function of the peer group itself could become the determining factor in maintaining Diane's level of peer contact.

CONCLUSIONS

Contingent social reinforcement and no prompting was employed in the first phase of the study and it did increase the rate of Diane's peer contact slightly. However, once prompting was applied as a technique of establishing the behavior, the rate of peer contact showed a marked increase. Also it was seen that prompts for specific classes of behavior such as verbal or nonverbal behavior increased that class of behavior. A rise in spontaneous, nonverbal behavior was seen in the final phases of the study.

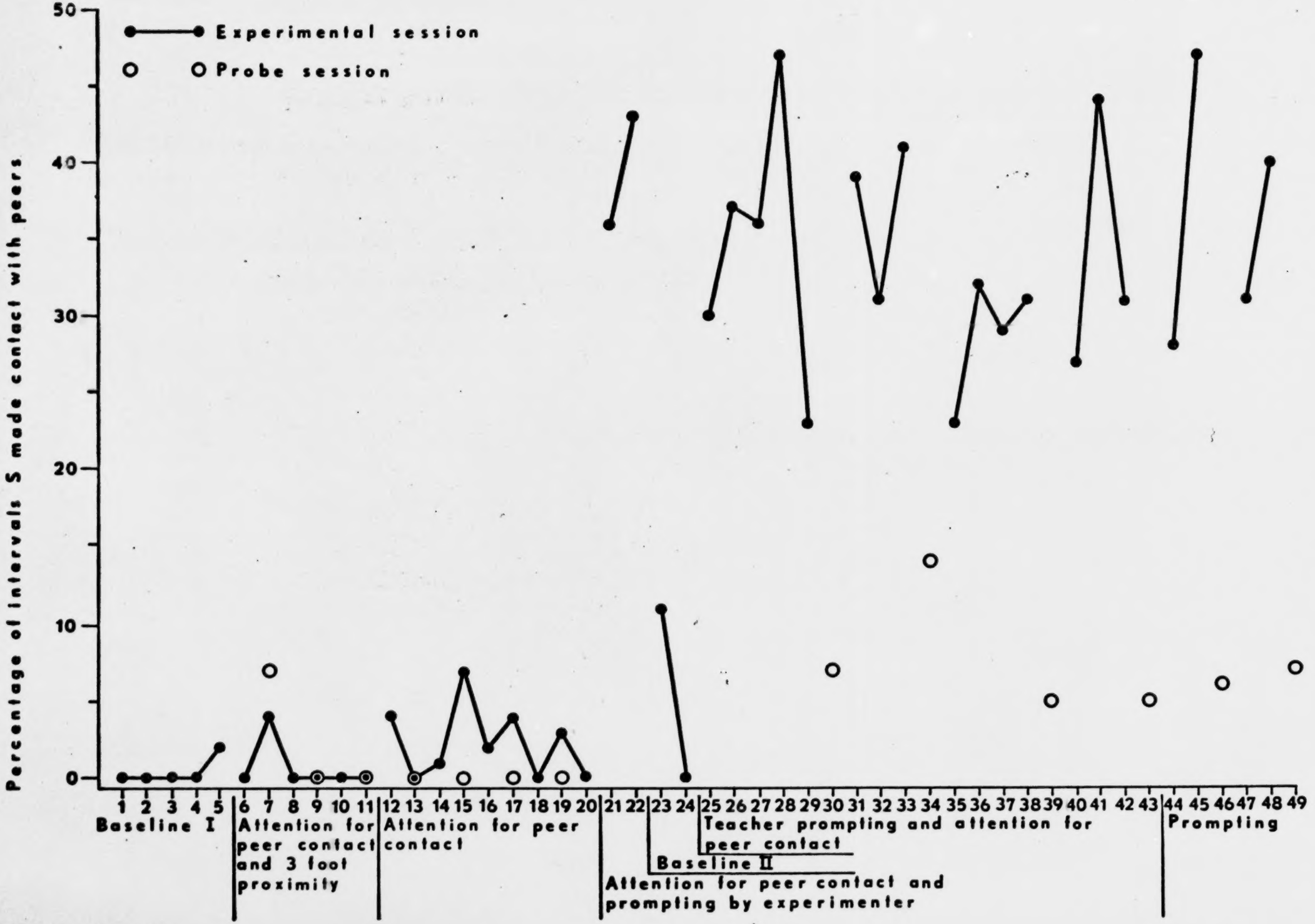
REFERENCES

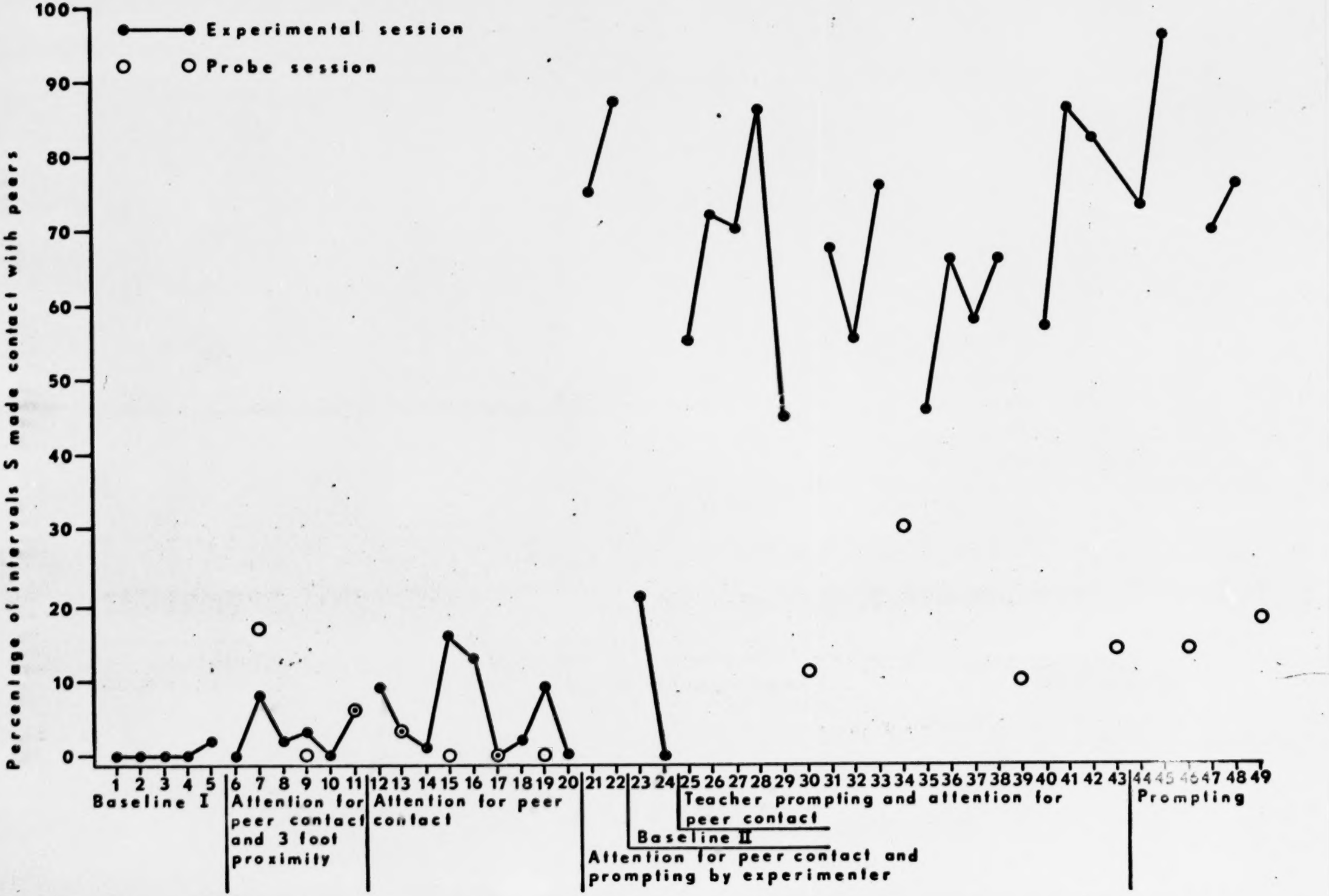
Allen, K. E., Hart, B. M., Buell, J. S., Harris, F. R. and Wolf, M. M. Effects of social reinforcement on isolate behavior of a nursery school child. Child Development, 1964, 35, 511-518.

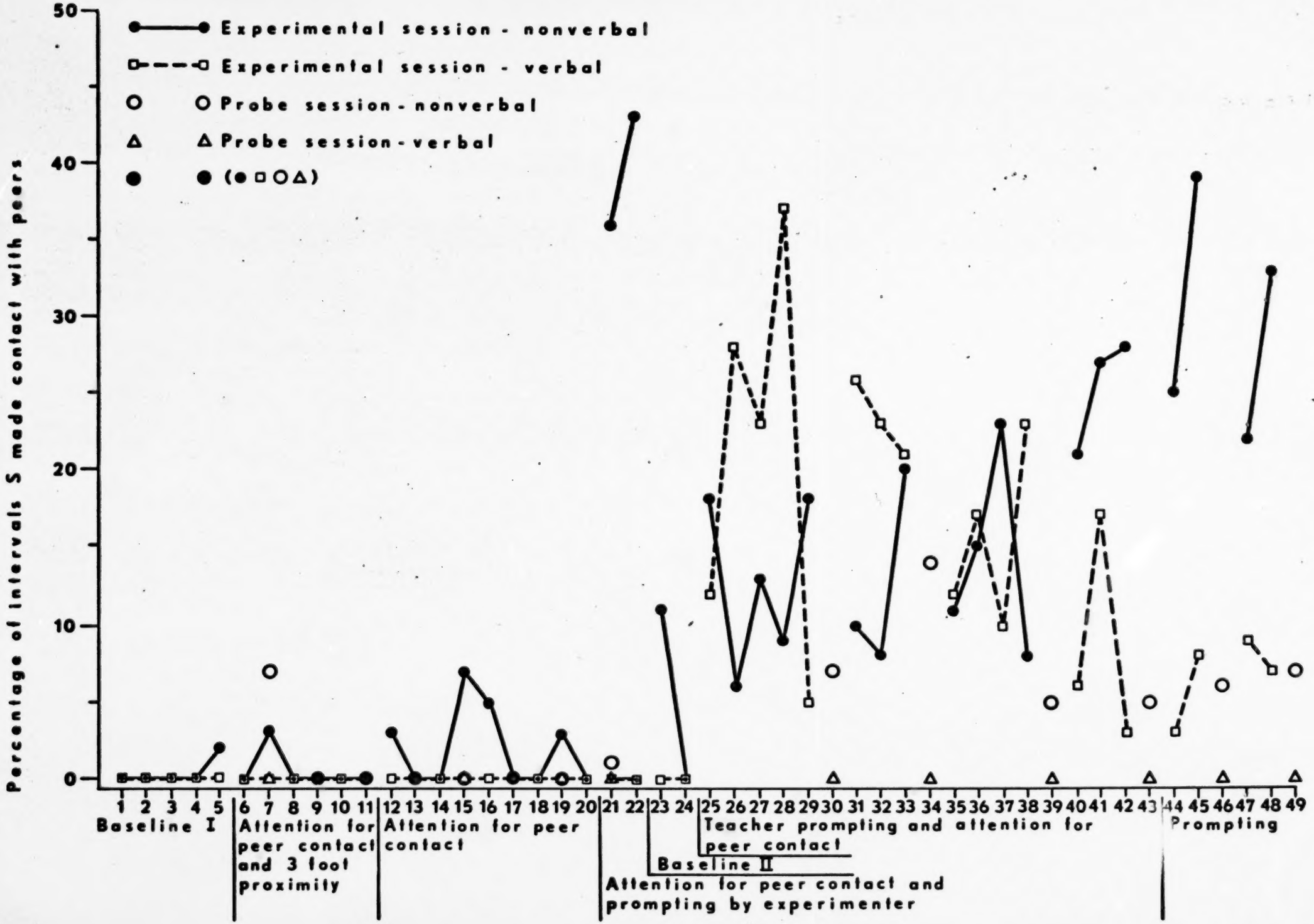
Harris, Florence R., Johnston, Margaret S., Kelley, C. Susan, and Wolf, M.M. Effects of positive social reinforcement on regressed crawling in a preschool child. Journal of Educational Psychology, 1964, 55, 35-41.

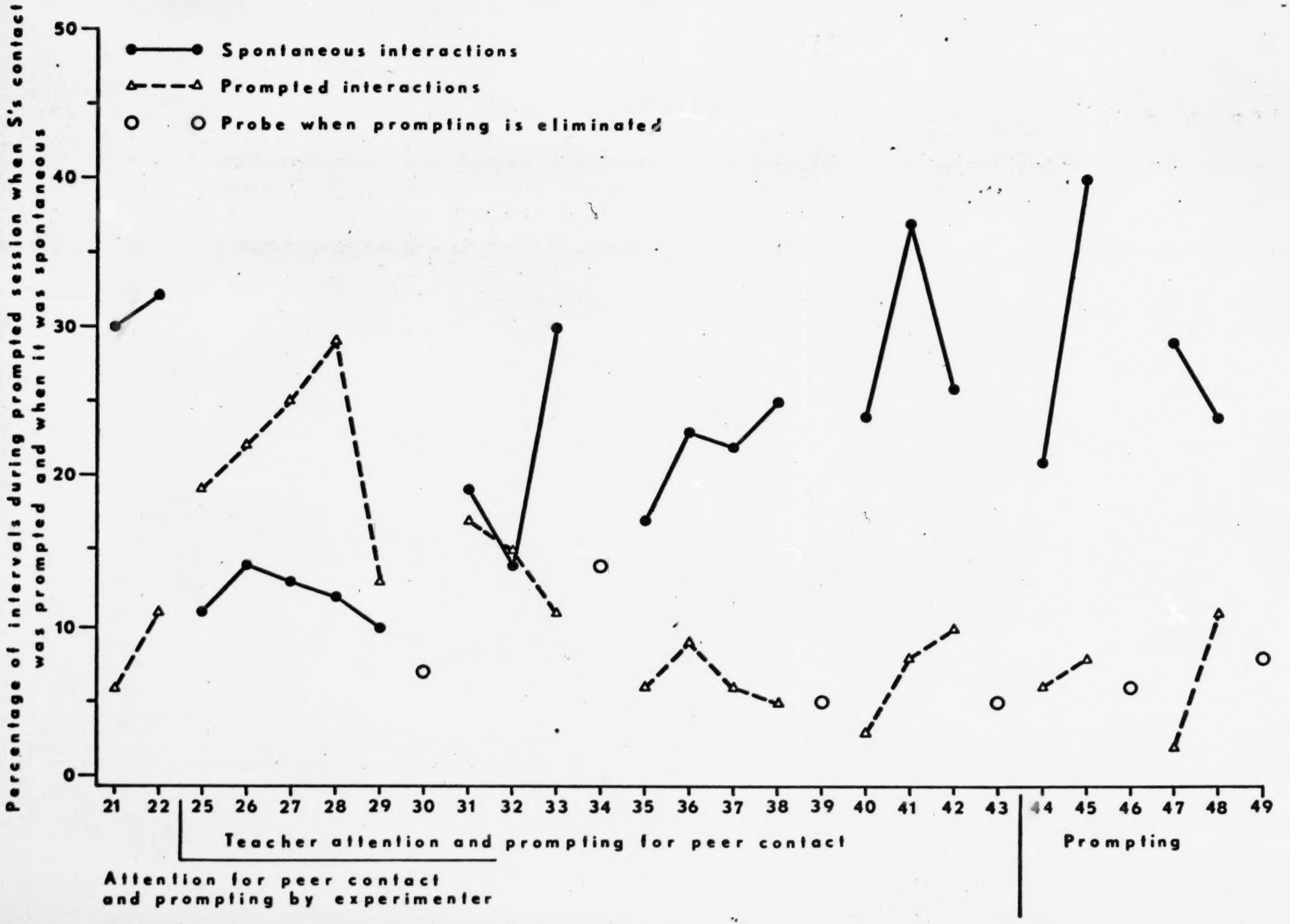
Social Interaction Observation Procedure, Training Manual, University of Kansas E & R Center, Progress Repote #1, Nov. '67.

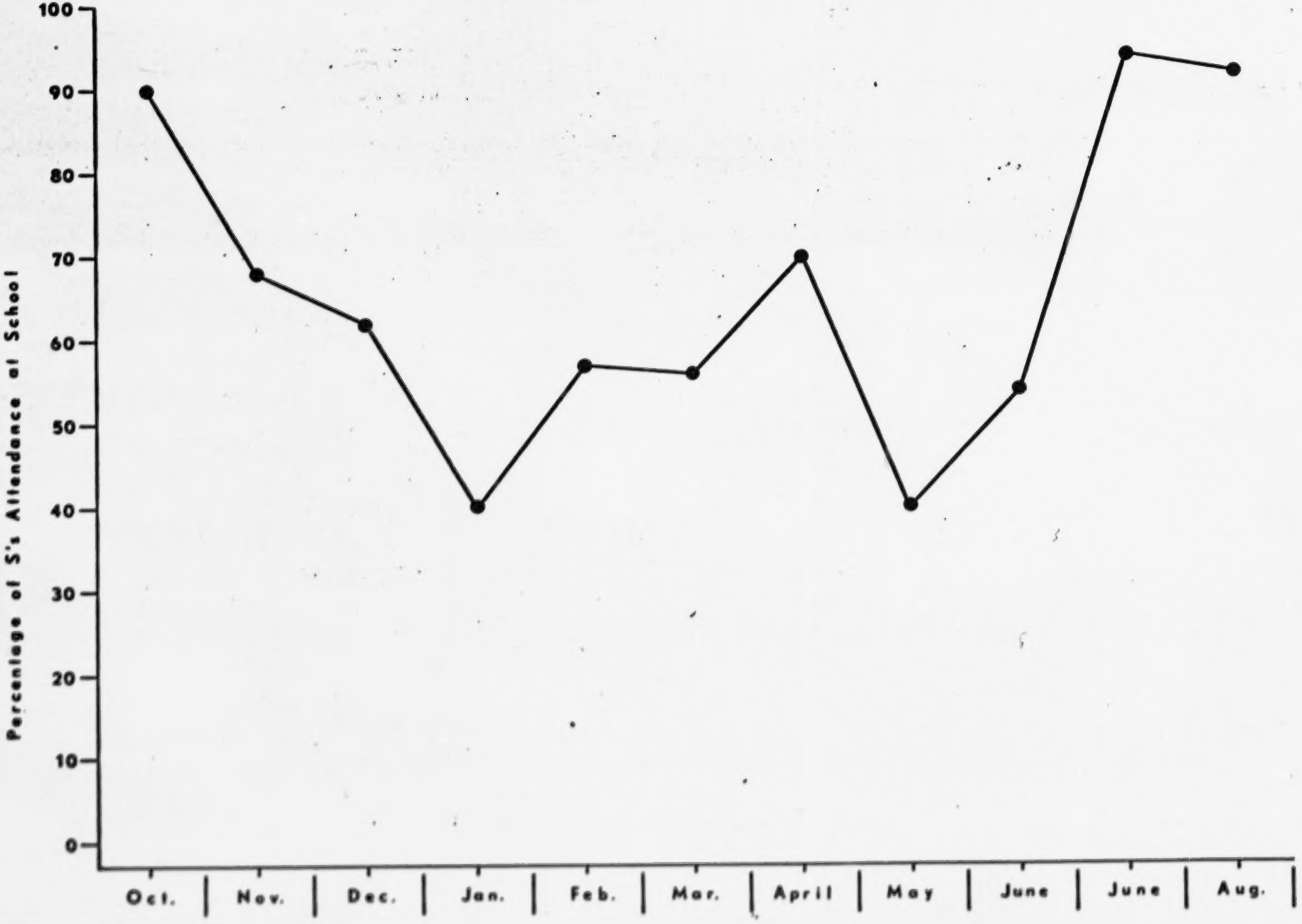
Wolf, M. M., Mees, H., and Risley, T. Application of operant conditioning procedures to the behavior problems of an autistic child. Behavior Research and Therapy, 1964, 1, 305-312.


Experimental session
Probe session
Percentage of intervals S made contact with peers
50
40
30
20
10
0
1 2 3 4 5
Baseline I
6 7 8 9 10 11
Attention for peer contact and 3 foot proximity
12 13 14 15 16 17 18 19 20
Attention for peer contact
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49
Baseline II
Attention for peer contact and prompting by experimenter
Teacher prompting and attention for peer contact
Prompting


Experimental session
Probe session
Percentage of intervals S made contact with peers
100
90
80
70
60
50
40
30
20
10
0
1 2 3 4 5
Baseline I
6 7 8 9 10 11
Attention for peer contact and 3 foot proximity
12 13 14 15 16 17 18 19 20
Attention for peer contact
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49
Teacher prompting and attention for peer contact
Baseline II
Attention for peer contact and prompting by experimenter
Prompting


Experimental session - nonverbal
Experimental session - verbal
Probe session - nonverbal
Probe session - verbal
(● □ ○ △)
Percentage of intervals S made contact with peers
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49
Baseline I
Attention for peer contact and 3 foot proximity
Attention for peer contact
Attention for peer contact and prompting by experimenter
Baseline II
Teacher prompting and attention for peer contact
Prompting


Spontaneous interactions
Prompted interactions
Probe when prompting is eliminated
Percentage of intervals during prompted session when S's contact was prompted and when it was spontaneous
50
40
30
20
10
0
21 22 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49
Teacher attention and prompting for peer contact
Attention for peer contact and prompting by experimenter
Prompting


Percentage of S's Attendance at School
100
90
80
70
60
50
40
30
20
10
0
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
April
May
June
June
Aug.